

Full Version of All Pending Claims:

1. (Currently Amended) A spacecraft emulation system comprising:
a central time source generating a time reference;
an emulated spacecraft control processor which contains an embedded processor that provides an emulated input/output interface to communicate simulated spacecraft data, wherein the embedded processor processes the simulated spacecraft data, and contains a ~~real-time~~ real-time clock having a real-time clock period; and,
a first simulation engine that processes attitude control system data from the emulated spacecraft control processor to simulate an attitude control system of ~~[[the]]~~ a spacecraft in real-time, the first simulation engine operative to produce sensor data for input to the emulated spacecraft control processor based on ~~[[the]]~~ simulated system dynamics and adjusts the ~~real-time~~ real-time clock period in response to the time reference.
2. (Currently Amended) The system ~~as recited in~~ of claim 1 further comprising a host computer which provides ~~[[the]]~~ command data and receives ~~[[the]]~~ telemetry data and time data from the emulated spacecraft control processor.
3. (Original) The system of claim 1, wherein the attitude control system data is communicated via a VMEbus.
4. (Currently Amended) The system of claim 3, further comprising a VMEbus interface manager which communicates ~~[[the]]~~ command data, ~~[[the]]~~ telemetry data and time between the VMEbus and ~~[[the]]~~ a host computer.
5. (Original) The system of claim 1, wherein the first simulation engine and the emulated spacecraft control processor are housed in a single housing.

6. (Currently Amended) The system ~~as recited in~~ of claim 1 wherein the first simulation engine processes attitude control system data from the emulated spacecraft control processor to simulate an attitude control system of the spacecraft in real-time.

7. (Currently Amended) The system ~~as recited in~~ of claim 1 wherein the central time source comprises a GPS server.

8. (Currently Amended) A spacecraft simulation system housed in a single housing comprising:

a central time source generating a time reference;

an emulated spacecraft control processor which contains an embedded processor that provides an emulated input/output interface to communicate simulated spacecraft data, wherein the embedded processor processes the simulated spacecraft data and contains a master counter; and,

a first simulation engine coupled to the time central time source and the emulated spacecraft control processor, the first simulation engine operative to produce data for input to the emulated spacecraft control processor based on the simulated system dynamic, and adjusts a time parameter of a ~~real-time~~ real-time clock in response to said master counter and said ~~central time count~~ time reference.

9. (Original) The system of claim 8, wherein the time parameter comprises short-term bias.

10. (Original) The system of claim 8, wherein the time parameter comprises long term drift.

11. (Currently Amended) The system ~~as recited in~~ of claim 8 wherein the first simulation engine processes attitude control system data from the emulated spacecraft control processor to simulate an attitude control system of ~~[[the]]~~ a spacecraft in real-time.

12. (Currently Amended) The system ~~as recited in~~ of claim 8 further comprising a second simulation engine which processes power, thermal, propulsion and payload subsystem data from the emulated spacecraft control processor or ground computer to simulate power, thermal propulsion and payload subsystems of ~~[[the]]~~ a spacecraft in real-time, the second simulation engine operative to produce data from the power, thermal, propulsion and payload subsystems for input to the emulated spacecraft control processor or ground computer based on ~~[[the]]~~ simulated system dynamics.

13. (Currently Amended) The system of claim ~~[[10]]~~ 12, wherein the power, thermal, propulsion and payload subsystem data includes simulated thermal command data, power command, propulsion command data, and payload command data.

14. (Currently Amended) The system ~~as recited in~~ of claim 8 wherein the central time source comprises a GPS generator.

15. (Currently Amended) A method of testing an embedded processor, the method comprising the steps of:

- providing an emulated spacecraft control processor that provides an emulated input/output interface;
- generating a master counter count in the emulated spacecraft control processor;
- generating a reference time from a central time source;
- receiving the master counter count and the reference time in a compute engine;
- and,
- determining a short term bias and a long term drift in response to the reference time and a master time counter count.

16. (Currently Amended) ~~[[A]]~~ The method ~~as recited in~~ of claim 15 further comprising the step of adjusting a ~~real-time~~ real-time clock in the ~~simulated~~ emulated spacecraft control processor to compensate for ~~[[the]]~~ short term bias and long term drift.

17. (Currently Amended) ~~[[A]]~~The method as recited in of claim 15 further comprising the step of adjusting a local time clock in the ~~simulated~~ emulated spacecraft control processor to compensate for ~~[[the]]~~short term bias and long term drift.

18. (Currently Amended) The method of claim 15 wherein the step of determining comprises the step of filtering the master counter count ~~[[and]]~~of the compute engine.

19. (Previously Presented) The method of claim 15 further comprising the step of modifying a time frame of the compute engine.

20. (Currently Amended) The method of claim 15 further comprising the step of slaving ~~the real-time~~ a real-time clock ~~[[and]]~~of the compute engine.

21. (Currently Amended) The method of claim 15 further comprising the step of time stamping data from the simulation engine with the reference time from the central time source.